

OREIS Fish Tissue Monitoring Data

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Introduction

This is a summary created by TDEC DoR-OR of fish tissue monitoring data pulled from OREIS on Oct 5, 2020. These data include all fish tissue data collected from January 2005 through March 2020 on the ORR. The summary is broken down by analyte and site within general contaminant type groups. Data are summarized per site and station. The intent of this summary report is to identify spatial, temporal, and analyte/COC gaps in fish tissue monitoring data.

All patterns identified and conclusions drawn are based on the data available in OREIS only.

Summary Tables by Sample Group

Metals

Generally, metals appear to be well sampled in Bear Creek, the upper and lower reaches of East Fork Poplar Creek, Melton Branch, the ETTP Ponds, and offsite.

Mercury sampling seems to be the primary focus of metals sampling of fish in White Oak Creek, Poplar Creek, Mitchell Branch, and the middle sections of East Fork Poplar Creek. Little to no other metals sampling has been conducted consistently in these streams since 2005.

See the table below.

Rads

Note the comparatively small size of this table. Rad sampling of fish is very limited, in terms of sample sizes, locations sampled, and radionuclides sampled.

Sampling is limited almost entirely to offsite locations.

Sampling is also limited to a small suite of analytes that may not represent the full suite of potential rad contaminants on the ORR, with the exception of the recent inclusion of some additional rads in 2019/2020.

Noteable rads that have not been sampled in the last 15 years or more, that are referenced in various waste handling plans or identified through historical process knowledge, and that often have high bioconcentration factors (BCF) include:

- Identified in a 1996 CR/PC OU RI/FS (many only sampled in 2019/2020)
 - Am-241
 - Co-60
 - Np-237
 - Po-210
 - Pu isotopes
 - Ru-106
 - Tc-99
 - U isotopes
 - associated daughter products (often hazardous/toxic)
- Identified in WAC, waste handling plan, or historical/process knowledge
 - Cd-113m

- Cs-134
- Cs-135
- Pd-107
- Se-79
- Sm-151
- Sn-11m
- Sn-126
- Tritium
- Zr-93
- Identified with high BCF
 - Am-241
 - C-14
 - Cd-113m
 - Cm isotopes
 - Co-60
 - K-40
 - Np-237
 - Po-210
 - Pu isotopes
 - Ru-106
 - Sn-126
 - Tc-99

Those that have been sampled have almost exclusively been sampled only in the Clinch River, and only very recently. No sampling appears to have occurred at any of the more interior stream locations where there is public access to streams receiving discharges from EMWMF or other burial grounds, or other areas internal to the ORR where fish exist in receiving streams.

See the table below.

PCBs and Pesticides

PCB and pesticide sampling of fish tissue appears to have pretty good spatial and temporal coverage, with the main exception being lack of sampling in Poplar Creek except at PCM 1.0, near the confluence with the Clinch River.

Dioxins and Furans

Only 3 locations have been sampled recently or consistently for dioxins and/or furans:

- Offsite
 - ERM 6.0
- ORNL
 - MEK 0.2
 - WCK 1.5

No sampling of fish tissue for dioxins or furans has occurred since 2005 at ETTP (Mitchell Branch or Poplar Creek) or Y-12 (Bear Creek or East For Poplar Creek) areas at all.

When sampling has occurred, sample sizes are noted to be generally small overall.

See table below.

Inorganics (MethylMercury)

Note: This table only contains data for methylmercury.

While mercury sampling of fish tissue appears to be a solid data set with good spatial and temporal coverage, the methylmercury sampling data set is not as comprehensive. Many stations throughout the ORR have not sampled specifically for methylmercury for 5-10 years. Stations where methylmercury sampling has been conducted recently have small sample sizes.

See table below.

Conclusion

The data represented in this summary were pulled from OREIS on October 5, 2020 and include data collected from 2005-2020 (based on availability on October 5, 2020). As such, the conclusions drawn are based on available data only.

Overall, the fish tissue monitoring program appears to be robust for:

- Metals, with the exceptions of the noted limited sampling in
 - White Oak Creek
 - Poplar Creek
 - Mitchell Branch
 - middle sections of East Fork Poplar Creek
- Mercury,
 - though note that methylmercury data coverage does not mirror mercury data coverage exactly
- PCBs and pesticides.

There are significant data gaps noted for:

- Rads
- Dioxins/Furans.

The fish tissue monitoring program should strive to begin addressing these data gaps, especially rad data gaps, as soon as possible.